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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,630	10/14/2003	Bruno H. Thut	HTS.35818	3711

7590 08/25/2005

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EXAMINER	
MILLS, DANIEL J	

ART UNIT	PAPER NUMBER
3679	

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/684,630	**Applicant(s)** THUT, BRUNO H.	
	Examiner Daniel J. Mills	**Art Unit** 3679	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _02 August 2005_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.

4a) Of the above claim(s) _19 and 20_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-18_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _14 October 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claims 19-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 8/2/2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweeney et al. (Sweeney – US 2,948,524) in view of Hohol (US 4,909,545).

Regarding claim 1, Sweeney discloses an apparatus for connecting a motor and an impeller of a pump for pumping molten metal, the apparatus comprising, an impeller shaft (22) having a first end (at 19) and second end (at 36), said first end being coupled to an impeller (19) and said second end having a mating surface (coupled to 36), a motor-driven rotating drive shaft (32) having a first end (close to 29) and a second end (at 34), said first end being coupled to a motor (29).

Sweeney discloses the use of a bayonet coupling to connect the motor driven drive shaft and the impeller shaft but discloses the female portion of the bayonet connector attached to the impeller shaft and the male portion of the bayonet connector attached to the motor shaft (the reverse of what applicant claims). However, the reversal of components in a prior art reference, where there is no disclosed significance to such reversal, is a design consideration within the skill of the art. In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955); In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). As such, it would have been a simple matter of engineering design choice to reverse the female portion and male portion of the bayonet connector in the disclosure of Sweeney. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention, to modify Sweeney to reverse to arrangement of the bayonet connector. This would have resulted in a first coupling member (shown at 34 on the end of the motor shaft) engaging said second end of said impeller shaft comprising two diametrically opposed pins (1 of the two shown at 34) extending outwardly from said impeller shaft, and a second coupling member (pointed to by 34) engaging said second end of said drive shaft (at 36), said second coupling member comprising, a sleeve having an inner diameter effective to receive said second end of said impeller shaft within said sleeve (34 and 36), a plate (comprising the U-joint extending form end of 35 to the end of 36) fixed to said sleeve having a mating surface cooperatively aligned with said mating surface of said impeller shaft, structure defining two pin receiving slots (1 of the two is shown at 34) in said sleeve, wherein each of said pins are received into one of said slots at one of two diametrically opposed pin entry points, whereby said slots are adapted for guiding each of said pins into a retained position, wherein said impeller shaft and said motor shaft are connectable and disconnectable by the application of rotational forces in opposing directions on said pins.

Sweeney fails to disclose tool engaging surfaces on an outer surface of the sleeve. However, Hohol teaches the use of tool engaging surfaces (22, 42) to be used as a gripping points for a wrench or some other tool. Accordingly it would have been obvious to modify the arrangement of Sweeney to include tool engaging surfaces for use as tool engaging surfaces as taught by Hohol.

Regarding claim 2, Sweeney in view of Hohol discloses the invention as claimed with the exception of a gasket disposed between a mating surface of the impeller shaft second end and the mating surface of said second coupling member. However, Hohol teaches the use of such a gasket system (gasket and mating surfaces adapted for use with a gasket) for sealing the coupler to the end of the shaft (column 2 lines 35-40 and line 49). Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeney, to include a gasket system as taught by Hohol, so that the coupler could be sealed to the end of the shaft.

Regarding claim 3, Sweeney in view of Hohol discloses an apparatus for connecting a motor and an impeller of a pump for pumping molten metal wherein said impeller shaft is comprised of graphite (column 3, lines 55-60).

Regarding claim 4, Sweeney in view of Hohol discloses an apparatus for connecting a motor and an impeller of a pump for pumping molten metal, with the exception of a first coupling member comprising a tube defining an inner opening that receives said second end of said impeller shaft, and said pins extend from said tube. However, Hohol teaches the use of such a first coupling member (14) to allow the flow of gas or liquid through the connector (column 2, lines 48-49).

Regarding claim 13, Sweeney in view of Hohol discloses a pump for pumping molten metal comprising, a submersible base (13) having an inlet, an outlet and an impeller chamber, a rotatable impeller disposed within said impeller chamber, a motor disposed remote from said impeller, an impeller shaft having a first end and second end, said first end coupled to said impeller and extending through an opening in said base and said second end having a mating surface, a first coupling member engaging said second end of said impeller shaft, and a second coupling member engaging said second end of said drive shaft, said second coupling member comprising a sleeve (34 and 36) having an inner diameter effective to receive said tube within said sleeve, a plate fixed (comprising the U-joint extending form end of 35 to the end of 36) to said sleeve having a mating surface that abuts said mating surface of said impeller shaft, structure defining two pin receiving slots in said sleeve, wherein each of said pins are received into one of said slots at one of two diametrically opposed pin entry points, whereby said slots are adapted for guiding each of said pins into a retained position extending through one of said slots, and at least two tool engaging surfaces on an outer surface of said sleeve, wherein said first coupling member and said second coupling member are connectable and disconnectable by the application of rotational forces in opposing directions on said pins and said tool engaging surfaces.

Sweeney in view of Hohol fails to disclose a first coupling member comprising a tube defining an inner opening that receives said second end of said impeller shaft, and two diametrically opposed pins extending outwardly from said tube.

Hohol teaches the use of a first coupling member comprising a tube defining an inner opening that receives said second end of said impeller shaft, and two diametrically opposed pins extending outwardly from said tube for the purpose of fitting the coupling member securely to a tube (column 1, lines 48-58). Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeney to include a first coupling member comprising a tube defining an inner opening that receives said second end of said impeller shaft, and two diametrically opposed pins extending outwardly from said tube as taught by Hohol for the purpose of fitting the coupling member securely to a tube.

Regarding claim 14, Sweeney in view of Hohol discloses a pump for pumping molten metal further comprising a gasket (Hohol column 2, lines 35-40) disposed between said mating surface of said impeller shaft and said mating surface of said plate, whereby said gasket is compressed to provide a seal between said impeller shaft and said second coupling member.

Regarding claim 15, Sweeney in view of Hohol discloses a pump for pumping molten metal wherein said impeller shaft is comprised of graphite (Sweeney column 3, lines 56-60).

Claims 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweeney et al. (Sweeney – US 2,948,524) in view of Hohol (US 4,909,545) as set forth in claims 1-4, 13-15 and further in view of Chalpin (US 3,233,428).

Regarding claim 16, Hohol in view of Sweeney discloses a pump for pumping molten metal but fails to disclose that said first coupling member comprises a plurality of set screws extending from an outer surface of said tube into said impeller shaft.

Chalpin teaches the use of a plurality of set screws (column 2, lines 16-21) to clamp a shaft to the bore in a shaft connector to enhance the connection between the shaft and the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Hohol in view of Sweeney, to include a first coupling member comprising a plurality of set screws extending from an outer surface of said tube into said impeller shaft to enhance the connection between the shaft and the connector.

Regarding claim 18, Hohol in view of Sweeney discloses a pump for pumping molten metal but fails to disclose that said first coupling member comprises a plurality of set screws extending from an outer surface of said tube into said motor shaft.

Chalpin teaches the use of a plurality of set screws (column 2, lines 16-21) to clamp a shaft to the bore in a shaft connector to enhance the connection between the shaft and the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Hohol in view of Sweeney, to include a first coupling member comprising a plurality of set screws extending from an outer surface of said tube into said motor shaft to enhance the connection between the shaft and the connector.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sweeney et al. (Sweeney – US 2,948,524) in view of Hohol (US 4,909,545) as set forth in claims 1-4, 13-15 further in view of Gilbert et al. (Gilbert - US 5,310,412).

Regarding claim 17, Sweeney in view of Hohol discloses a pump for pumping molten metal comprising a gas source (30) located proximal said motor shaft first end, but fails to disclose that the impeller shaft, motor shaft, first coupling member and second coupling member have structure defining a co-axial passage for injecting a gas there through.

Hohol teaches the use of first and second connectors with axial passages to allow the flow of gas or liquid. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention, to modify the arrangement of Sweeney, to include axial passages in both connectors to allow the flow of gas or liquid (perhaps for cooling, such as is done in sodium filled exhaust valves in IC engines)..

Gilbert teaches the use of passages in pump shafts is useful to allow the flow of gas there through. Accordingly it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeney in view of Hohol to include passages in the pump shafts to allow the flow of gas there through.

DPS Claims ~~8-12~~ 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohol (US 4,909,545) in view of Sweeney et al. (Sweeney – US 2,948,524).

Regarding claim 8, Hohol discloses an apparatus for coupling a motor-driven shaft and an impeller shaft of a pump comprising, a first coupling member (14) adapted to engage an end of a shaft (column 1, lines 48-58), said first coupling member comprising a tube (threaded tube 30) defining an inner opening that receives said end of said shaft, and two diametrically opposed pins (36, 38) extending outwardly from said tube, and a second coupling member (12) adapted to engage an end of a shaft (column 1, lines 48-58), said second coupling member comprising, a sleeve (threaded sleeve 20) having an inner diameter effective to receive said tube within said sleeve, a plate (24) fixed to said sleeve having a mating surface proximal a mating surface of said shaft end (column 2, lines 35-40), structure defining two pin receiving slots (50) in said sleeve, wherein each of said pins are received into one of said slots at one of two diametrically opposed pin entry points, whereby said slots are adapted for guiding each of said pins into a retained position extending through one of said slots a plurality of tool engaging surfaces (22) on an outer surface of said sleeve, and a connecting tube fixed to said plate and coaxial to said shaft, wherein said first coupling member and said second coupling member are connectable and disconnectable by the application of rotational forces in opposing directions on said pins and said tool engaging surfaces.

Hohol fails to disclose that the shafts connecting to the coupler are an impeller shaft, and a drive shaft.

Sweeney teaches the use of this type of bayonet connector to couple a motor drive shaft and impeller shaft for the purpose of making for the convenient changing of pump shafts. Sweeney discloses the use of this type of connector in a reverse orientation compared with applicant's disclosure, but it would have been an obvious matter of design choice to reverse the orientation of the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Hohol to be connected to a motor drive shaft and impeller shaft as taught by Hohol, for the purpose of making for the convenient changing of pump shafts.

Regarding claim 9, Hohol in view of Sweeney discloses an apparatus for coupling a motor-driven shaft and an impeller shaft of a pump further comprising a gasket (column 2, lines 35-40) disposed between said mating surface of said impeller shaft end and said mating surface of said plate, whereby said gasket is compressed to provide a seal between said impeller shaft and said plate.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohol (US 4,909,545) in view of Sweeney et al. (Sweeney – US 2,948,524) as set forth in claims 8-9 and further in view of Chalpin (US 3,233,428).

Regarding claim 10, Hohol in view of Sweeney discloses an apparatus for coupling a motor-driven shaft and an impeller shaft of a pump but fails to disclose that said first coupling member comprises a plurality of set screws extending from an outer surface of said tube into said impeller shaft.

Chalpin teaches the use of a plurality of set screws (column 2, lines 16-21) to clamp a shaft to the bore in a shaft connector to enhance the connection between the shaft and the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Hohol in view of Sweeney, to include a first coupling member comprising a plurality of set screws extending from an outer surface of said tube into said impeller shaft to enhance the connection between the shaft and the connector.

Regarding claim 11, Hohol in view of Sweeney discloses an apparatus for coupling a motor-driven shaft and an impeller shaft of a pump but fails to disclose that said first coupling member comprises a plurality of set screws extending from an outer surface of said tube into said motor shaft.

Chalpin teaches the use of a plurality of set screws (column 2, lines 16-21) to clamp a shaft to the bore in a shaft connector to enhance the connection between the shaft and the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Hohol in view of Sweeney, to include a first coupling member comprising a plurality of set screws extending from an outer surface of said tube into said motor shaft to enhance the connection between the shaft and the connector.

Regarding claim 12, Hohol in view of Sweeney discloses an apparatus for coupling a motor-driven shaft and an impeller shaft of a pump wherein said first coupling member and said second coupling member have structure defining a co-axial passage for injecting a gas through said coupling assembly.

Claims 5, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweeney et al. (Sweeney – US 2,948,524) in view of Hohol (US 4,909,545) as set forth in claims 1-4, 13-15 and further in view of Chalpin (US 3,233,428)

Regarding claim 5, Sweeney in view of Hohol discloses an apparatus for connecting a motor and an impeller of a pump for pumping molten metal, with the exception of a first coupling member comprising a plurality of set screws extending from an outer surface of a tube into said impeller shaft.

Hohol teaches the use of a tube shaped first coupling member to allow the coupling member to fit over the end of the member it is connected to. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeny in view of Hohol, to use a first connector with a tube section as taught by Hohol, so that the connector could fit over the end of the impeller shaft.

Chalpin teaches the use of a plurality of set screws (column 2, lines 16-21) to clamp a shaft to the bore in a shaft connector to enhance the connection between the shaft and the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeney in view of Hohol, to include a first coupling member comprising a plurality of set screws extending from an outer surface of said tube into said impeller shaft to enhance the connection between the shaft and the connector.

Regarding claim 7, Sweeney in view of Hohol discloses an apparatus for connecting a motor and an impeller of a pump for pumping molten metal, but fails to disclose a second coupling member comprising a connecting tube (36) coaxial to said motor shaft and fixed to said plate and a plurality of set screws extending from an outer surface of said connecting tube into said motor shaft.

Chalpin teaches the use of a plurality of set screws (column 2, lines 16-21) to clamp a shaft to the bore in a shaft connector to enhance the connection between the shaft and the connector. Accordingly, it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeney in view of Hohol, to include a second coupling member comprising a plurality of set screws extending from an outer surface of said tube into the motor shaft to enhance the connection between the shaft and the connector.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sweeney et al. (Sweeney – US 2,948,524) in view of Hohol (US 4,909,545) as set forth in claims 1-4, 13-15 and further in view of Gilbert et al. (Gilbert - US 5,310,412).

Regarding claim 6, Sweeney in view of Hohol discloses an apparatus for connecting a motor and an impeller of a pump for pumping molten metal, comprising a gas source (Sweeney 30) located proximal said motor shaft first end, but fails to disclose that the impeller shaft, motor shaft, first coupling member and second coupling member have structure defining a co-axial passage for injecting a gas there through.

Hohol teaches the use of first and second connectors with axial passages to allow the flow of gas or liquid. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention, to modify the arrangement of Sweeney, to include axial passages in both connectors to allow the flow of gas or liquid (perhaps for cooling, such as is done in sodium filled exhaust valves in IC engines).

Gilbert teaches the use of passages in pump shafts is useful to allow the flow of gas there through. Accordingly it would have been obvious at the time of applicant's invention, to modify the arrangement of Sweeney in view of Hohol to include passages in the pump shafts to allow the flow of gas there through.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Howard (US 1,885,321), Cooper (US 5,330,328 and US 4,954,167), Eckert (US 5,397,377), are cited for pertaining to applicant's invention. Several additional US patents by Thut, the current applicant are cited as they appear to be relevant to the subject matter of this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Mills whose telephone number is 571-272-8115. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on 571-272-7087. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel P Stodola

DJM

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8/17/2005

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